

HISTORICAL VIGNETTES IN VASCULAR SURGERY

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First textbook in vascular surgery

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Giovanni da Vigo, an Italian surgeon, wrote the first surgical book, *Practica Copiosa in Arte Chirurgica*, in Latin in 1514.¹ In the United States, John Dorsey, a University of Pennsylvania surgeon, was the first to write a systemic textbook of surgery. The book *Elements of Surgery* was published in two volumes in 1813.² As vascular surgery emerges as a surgical specialty and also for historical interest, it is time to examine the first textbook in vascular surgery. According to Rutkow,³ Bertram Bernheim (1880-1957), a surgeon from Johns Hopkins University in Baltimore, authored America's first textbook in vascular surgery. The book, *Surgery of the Vascular System*, was published by J. B. Lippincott & Co in 1913.⁴

The book is 9" × 6" in size, hardcover in a deep blue color with 104 pages and 53 illustrations (Fig 1). There are 10 chapters with the first two on general technique and transfusion. This is followed by a chapter on end-to-end suture and a chapter on lateral anastomosis. The Carrel triangular technique was nicely illustrated. Chapter 5 is about transplantation of a segment of vein or artery as a short interposed graft. The arteriovenous anastomosis or so-called reversal of the circulation was described in detail in another chapter. The technique was intended to divert arterial flow to the venous system to increase nutrient supplies to tissues when arterial flow was cut off from circulation. This procedure is now obsolete. Surgical removal of varicose veins was advocated. Also of interest is the transposition of saphenous vein below the competent valve of the femoral vein (10 cm lower than normal junction) to prevent venous reflux, an early idea on venous valve surgery. The chapter on surgery of the heart focused mostly on repair of heart wounds, and pericardiotomy was briefly mentioned. In ancient days, aneurysm was always of prime

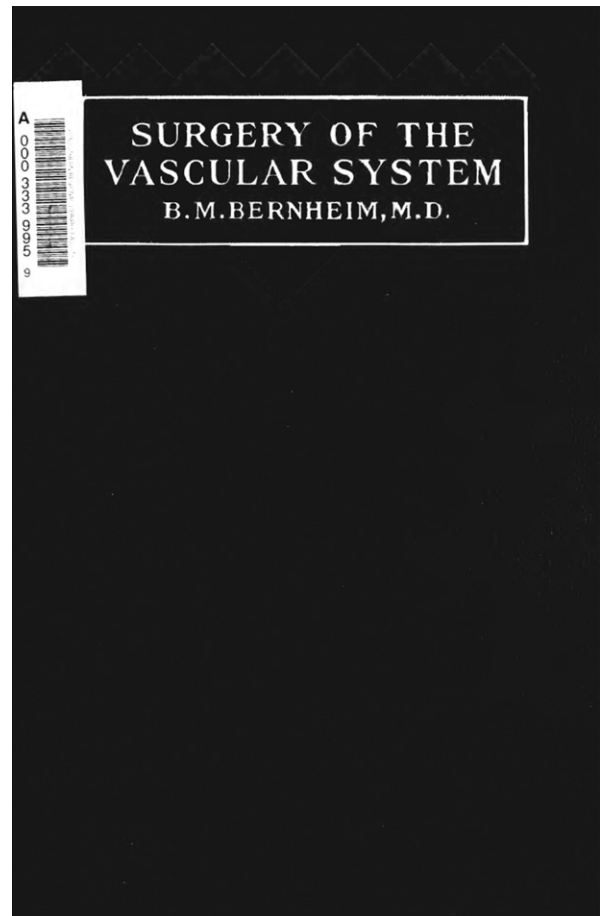


Fig 1. First American textbook of vascular surgery by B. M. Bernheim.⁴ Reproduced with permission.

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Competition of interest: none.

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interest to surgeons. A chapter on the treatment of aneurysm discussed in detail the Matas endoaneurysmorrhaphy technique. Two other techniques to treat aneurysm, gradual occlusion by a metal band and wiring of the aneurysm, were also described. The metal band technique was pioneered by Halsted and it is designed to promote collateral circulation (Fig 2). The book finished with a chapter on statistical study of the treatment by proximal ligation of aneurysms in various locations reported in the literature. In

the early 1900s, vascular surgery was still in its infancy, and it is not surprising that the book is rather small in size and brief. The contents of the book do reflect the status of prereconstructive vascular surgery at that time period.

Bertram Bernheim, a graduate of Johns Hopkins, spent most of his time in the Hunterian Laboratory of the Department of Surgery. His experimental work centers on the application of techniques by Matas and Carrel. He wrote *Surgery of the Vascular System* while he was Instructor of Surgery at Hopkins. In 1909, he was summoned by Halsted to perform a vein graft. Halsted had removed a sarcoma from the popliteal space of a patient, resulting in a large popliteal arterial defect. Bernheim attempted to bridge the gap with a long segment of great saphenous vein but it thrombosed.⁵ Undeterred by the experience, Bernheim continued his laboratory work on vein graft. In August 1915, he got a second chance when he performed a vein graft in a patient with an expanding popliteal aneurysm. He used a posterior approach and the long saphenous vein as a conduit. After opening the aneurysm, he anastomosed the graft to the proximal and distal openings of the aneurysm. Part of the aneurysm wall was wrapped around the graft for reinforcement (Fig 3). This is the first successful vein graft reported in the United States, 9 years after Goyanes of Madrid reported the use of popliteal vein as a graft in a patient with popliteal aneurysm.⁵ It is surprising that no further works on the use of vein graft were reported by Bernheim. At Hopkins, Bernheim was surrounded by surgical giants such as W. S. Halsted, John M. T. Finney, and J. C. Bloodgood and at the Hunterian Laboratory he worked with Harvey Cushing. He was also the first surgeon to perform laparoscopic surgery. His lifetime and works have been reported by Williams in his Presidential address to the Southern Association for Vascular Surgery.⁶

Some early writings in vascular surgery published during the same time period deserve mention. The first is *Blood Vessel Surgery and Its Applications* by Charles Guthrie, published in 1912. Guthrie was not a surgeon but a physiologist with interest in organ transplantation. The book did not mention treatment of vascular problems. He understood the importance of an intact arterial anastomosis to achieve a successful transplantation. He then concentrated his work on arterial anastomosis. The book gave details on the development of arterial anastomosis, including his works with Alex Carrel who spent some time in Guthrie's laboratory. Alex Carrel won the Nobel Prize without mentioning Guthrie in his description of triangular anastomosis technique. This notable omission has generated much controversy about Alex Carrel. Another textbook in vascular surgery that deserves special attention is *Die Chirurgie der Blutgefäße und des Herzens (Surgery of the Blood Vessels and the Heart)* published in 1913 by Ernst Jeger, a German surgeon. Jeger gave a summation on the status of vascular and experimental heart surgery at the turn of the century. He was also the first to describe the principle of bypass graft for arterial aneurysm, many years before Jean Kunlin conceived the idea.⁷⁻¹⁰ (Fig 4). In 1915, J. Shelton Horsley of Richmond, Virginia, published *Surgery of the Blood Vessels*. Once again, the book dwelled heavily on arterial anastomosis techniques and on how to stop hemorrhage. It is also of interest that hemorrhoids were given a chapter and were considered a vascular disorder. In 1939, two books with a more systemic approach to vascular disease were published. These are *Circulatory Diseases of the Extremities* by John Homans and *Peripheral Vascular Diseases: Diagnosis and Treatment* by two internists, William Collens and Nathan Wilensky of New York City. The book by Homan gave a detailed description of deep vein thrombosis and venous

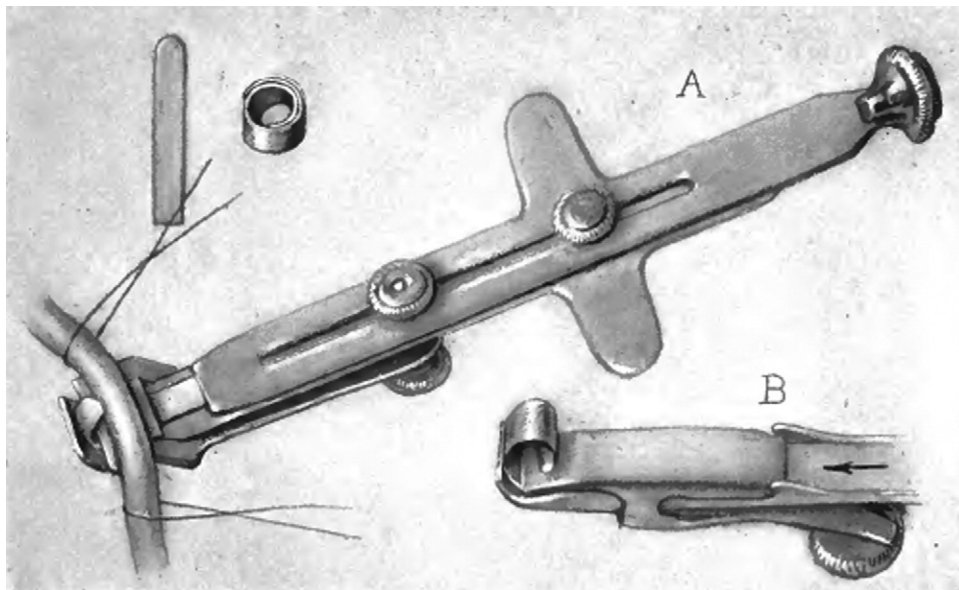


Fig 2. A, Halsted's original band roller in the act of curling a metal strip about an artery. B, The improved band roller about to expel a band. From Bernheim BM.⁴ Reproduced with permission.

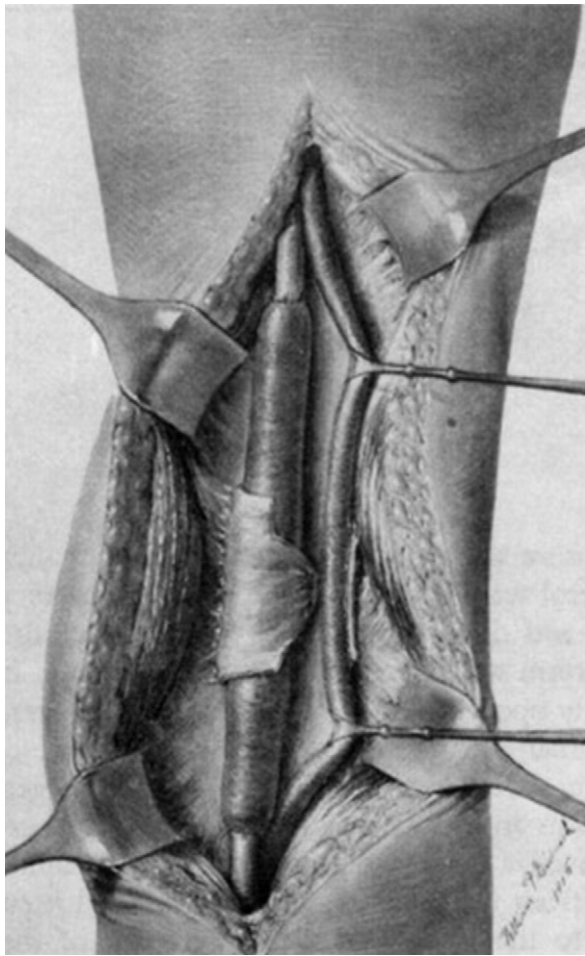


Fig 3. Popliteal vein graft performed by B. M. Bernheim for a patient with expanding popliteal aneurysm. From Williams GM.⁵ Reproduced with permission.

insufficiency as well as the use of heparin, which was just being introduced for clinical use.

The founding of the Society for Vascular Surgery and the breakthrough decade of the 1950s with direct surgery on arteries such as homograft of abdominal aortic aneurysm (AAA), carotid endarterectomy, and femoropopliteal vein graft ushered in the era of reconstructive vascular surgery. At this time, internists from Mayo Clinic, Edgar Allen, Nelson Barker, and Edgar Hines, authored a book (*Peripheral Vascular Disease*), which is considered by many a classic and a complete textbook on vascular disease. The book went on to a 5th edition authored by John Juergens, John Spittell, and John Fairbairn. In 1949, Gerald Pratt, a surgeon from New York University, first published a book on *Surgical Management of Vascular Diseases*.

After the decade of the 1950s, vascular surgeons began to write textbooks on vascular surgery. These include *Peripheral Vascular Disorders* (1956) by Peter Martin, R. Beverly Lynn, J. Henry Dible, and Ian Aird; *Vascular Surgery* (1959) by Geza de Takats; *Vascular Surgery* (1963) by John

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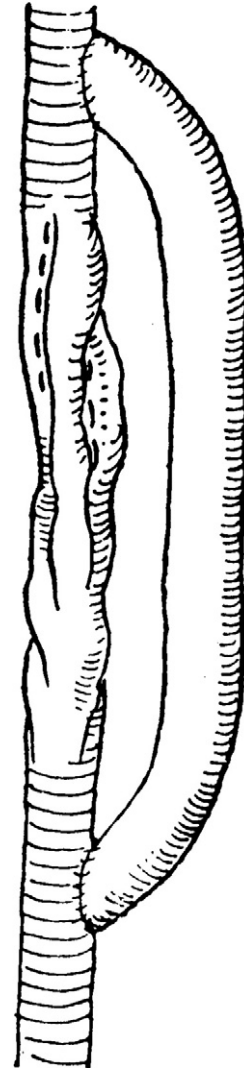


Fig 4. Diagram of bypass principle described by Jeger in 1913.¹⁰ Reproduced with permission.

Kinmonth, Charles Rob, and Fiorindo Simeone; *Arterial Surgery* (1969) by H. H. G. Eastcott. Two large textbooks on vascular surgery appeared in the 1970s—*Vascular Surgery: Principles and Techniques* (1976) by Henry Haimovici and *Vascular Surgery* (1977) by Robert Rutherford. Since then, there have been other vascular surgery textbooks, including textbooks by Moore, Ernst–Callow, Veith–Hobson–Williams–Wilson, Ernst–Stanley, Bell–Jamieson–Buckley, and White–Hollier. The numbers equal those of general surgery textbooks (Norton, Schwartz, Souba, Sabiston, Corson, Greenfield, and Cameron). Of all textbooks in vascular surgery, Rutherford's book remains the encyclopedic source of information on vascular disease. It is of interest to note that Rutherford, like Bernheim who wrote

the first book, was a Johns Hopkins trainee before he became professor of Surgery at University of Colorado. The current Rutherford's book is the 7th edition, in two volumes with more than 2000 pages. The 7th edition is published by Elsevier in association with the Society for Vascular Surgery under two new editors, Jack L. Cronenwett and K. Wayne Johnston. Vascular surgery indeed has grown into a surgical specialty.

The author thanks James Black, MD, for the provision of the copy of the book *Surgery of the Vascular System* by Bertram M. Bernheim from the Johns Hopkins Medical Library.

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